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This report summarizes the major conclusions of the Aviation Briefing for Community Colleges, which met to establish dialogue between community colleges and the aviation industry. Included are: (1) an overview of community college aviation, covering the topics of the aviation industry, the rationale for aviation in the community college, the types of community college aviation programs, and some misunderstandings about community college aviation education; (2) a survey of community college aviation programs; and (3) some conclusions and the suggestion that communication among schools and between the industry and education be improved. Appended is a list of colleges that have aviation programs, and the types of programs at each. (MC)

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Institute for Community College Development / Johnson County Community College

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AVIATION AND THE COMMUNITY COLLEGE

by

Harold L. Finch
Russell W. Watson

UNIVERSITY OF CALIF.
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Institute for Community College Development
Johnson County Community College
Shawnee Mission, Kansas

PREFACE

As community colleges have developed within the past several years, they have sought to help members of their communities learn how to live–and how to earn a living. Their efforts to serve their students and their communities are exemplified by their rapid development of programs in the various areas of aviation.

The Aviation Briefing for Community Colleges (ABC) held last year in Kansas City was jointly sponsored by Metropolitan Junior College-Kansas City and the Link Foundation. It was a giant step forward in a dialogue among individual community colleges as well as between the colleges and the aviation industry. This conference pointed up the need for further research.

This report summarizes the major conclusions of the ABC. It also describes for the first time the results of a survey of community college aviation programs which was conducted by Harold L. Finch, Dean of Instruction, Johnson County Community College, and sponsored by Cessna Aircraft Company. This report was co-authored by Dean Finch, who also directed the ABC, and Russell W. Watson of the Air Age Education Division of Cessna Aircraft Company, who served on the Executive Committee of the ABC.

We are indebted to Dr. Lewis R. Fibel, Specialist in Occupational Education, American Association of Junior Colleges; Edward Schuett, Assistant to the Vice President of Trans World Airlines, and to Professor Stewart M. Angle, Head, Aviation, Mt. San Antonio College, for their careful review of the manuscript.

Johnson County Community College is pleased to share this report as the first product of its Institute for Community College Development. We hope that the information we've gathered will be of value to community colleges throughout the nation as they fulfill their important role in the lives of their students.

ROBERT G. HARRIS
February 1969
President, Johnson County Community College

INTRODUCTION

The rapid growth of the community college movement coupled with that of aviation has resulted in a recent, unprecedented increase in the number of operational community college aviation programs. For example, the growth-rate of community college flight programs during the 1966-67 school year was approximately 300 percent and programs are continuing to be introduced at a high rate. Based on the best available information today, it is conservatively estimated that there could be over one hundred additional community college aviation programs within the next two years.

During this period of rapid expansion, many knowledgeable observers have voiced the fear that conditions were conducive to hastily planned programs of marginal quality which would be detrimental to the aviation industry and to education. In response to this concern, the following related projects were carried out in 1968:

- The first Aviation Briefing for Community Colleges*.
- A survey of existing community college programs.

The objectives of these two undertakings were to identify problem areas and to begin developing solutions.

These projects are summarized in this report. First, an overview of community college aviation education based on a consensus of findings from the ABC is presented, then results of the survey of existing aviation programs are given in narrative form. Lastly, concluding remarks applicable to community college administrators considering the addition or expansion of aviation programs are presented.

**The Aviation Briefing for Community Colleges (ABC) was held April 1-3 in Kansas City. The conference was co-sponsored by the Link Foundation and Metropolitan Junior College-Kansas City.*

A CURRENT OVERVIEW OF COMMUNITY COLLEGE AVIATION EDUCATION

Informal and structured sessions conducted at the ABC resulted in a considerable volume of pertinent dialogue between the 260 delegates who represented government, industry and 150 colleges. Topics focused on various aspects of aviation—what it is, where it is going and why and how it is taught in community colleges. A compilation of salient facts and a consensus of opinion emanating from these sessions follows:

THE AVIATION INDUSTRY

The aerospace industry has been the nation's largest non-agrarian employer since 1962. Since that time more people have earned their living designing, building, selling, servicing, using and supporting aerospace vehicles than have been active in any other industry outside of agriculture.

Aviation is growing at a much faster rate than the economy as a whole and even more rapid expansion is anticipated for the future. During the next twelve years the business of transporting people by air is expected to triple in size on a world wide basis. Likewise, air cargo is expected to grow from 2.8 billion ton-miles in 1965 to 20 billion ton-miles in 1975.

Aviation has many facets. Four functional segments of aviation are:

- General aviation.
- Air carriers.
- Manufacturing.
- Federal government.

General aviation is easiest to define in terms of what it is not. It is that portion of flight activity which is not military or airline flying. It includes about 117,000 aircraft and 600,000 licensed pilots. It includes corporate flying for executives, air-taxi and charter flights, agricultural spraying, flight training and personal flying. It is the most rapidly growing area of aviation in terms of job opportunities. The general aviation fleet is expected to expand about 40 percent by 1975 to a size of about 160,000 airplanes.

Air carriers, commonly referred to as commercial airlines, operate about 2,400 airplanes. The scheduled airlines in this country now have 285,000 people on the payrolls. The employment growth is currently running about 35,000 additional employees per year and within ten years this rate may be doubled. Air carriers are looking forward to the introduction of "jumbo jets" such as the Lockheed 1011 and the Boeing 747, which can carry up to 490 passengers, and the "SST"

supersonic transport, which will have speeds of 1,800 miles per hour, bringing London within two hours of New York City.

Manufacturing, like all segments of aviation, is a business of vital concern to community colleges. Employment today exceeds 1,400,000 persons in just the production side of the aerospace industry. The aerospace industry represents one person out of every twelve who are employed in the total manufacturing industry of the United States. More than 800,000 of these people are employed in the production of aircraft, not including the missile and space efforts.

Federal government activities in aviation, aside from military activities, are largely a function of the Federal Aviation Administration (FAA) of the Department of Transportation. One of the responsibilities of the FAA is the certification of aircraft, pilots and other flying personnel and maintenance technicians. It also develops plans for the most efficient use of the air space over the United States and operates the air traffic control system to provide a safe and efficient flow of traffic. The FAA employs 44,000 persons in such capacities as pilots, maintenance officers, engineers, administrators and air traffic control specialists.

RATIONALE FOR AVIATION IN THE COMMUNITY COLLEGE

Civilization has developed in proportion to man's ability to go places. Each improvement in transportation from the first wheel to the latest airplane has enabled man to increase his radius of action, to expand his acquisition and distribution of resources and to improve the comfort and quality of his living.

Young people need to understand the vast effect that aviation has had and is having on their lives, and more importantly the effect it will have on their futures. It is necessary that they know and learn how to employ aviation to improve their nation, their communities and themselves. Mr. Najeeb Halaby, President of Pan-American World Airways, said it well in his ABC keynote address: "There is one basic characteristic that typifies the working environment of the air transportation industry. It is the element of challenge...we are still writing the book on how to fly a man through the air with the greatest of ease and I think you can judge that there are a number of exciting chapters still to come."

Aviation programs of various types are necessary at the community college level for a number of specific reasons. It prepares students:

- To qualify for the many college level jobs in aviation.
- To be more effective in non-aviation careers.
- To be a better informed citizen.
- To attain personal enrichment and satisfaction.

Since more jobs are waiting for young people in aviation than in any other industry, the provision of career training in aviation is a very appropriate college endeavor. Programs are needed for pilots, mechanics, administrators and managers, air traffic controllers and hostesses.

Young people may also employ aviation skills to enhance their effectiveness in many non-aviation fields such architecture, engineering, marketing and business

management. Successful people in all professions pilot airplanes to get to more places quicker and easier. Supplementary flight training can be a real advantage to the community college student.

Because of the social, political, economic and technological impact of aviation upon our society an understanding of the role of aviation in shaping these forces is essential for every knowledgeable citizen. Aviation cannot be subtracted from the lives of young people and it should not be ignored in education.

Aviation skills provide graduates an opportunity for personal travel and enjoyment which is unexcelled. Learning about the many areas involved in flying such as physical science, mathematics, meteorology and geography provides a high degree of satisfaction. The student has a reason to excel as there is no room for mediocrity in aviation.

TYPES OF COMMUNITY COLLEGE AVIATION PROGRAMS

The five most commonly offered aviation programs in the community college are:

- Flight training.
- Technician and mechanics training.
- Hostess training.
- Aviation administration training.
- Air traffic controller training.

Flight training is by far the most popular offering in terms of numbers of programs. It consists of ground instruction and often includes flight training. Flying programs generally prepare students for private pilot certificates and may include additional training for commercial certificates and instrument, instructor and multi-engine ratings. Instruction is either offered directly by the college, or it is provided through an arrangement with a local FAA-approved flight school.

Technician and mechanics training encompasses engineering technology, aircraft instrument technology, airframe and powerplant (A&P) maintenance and aviation electronics (avionics) technology. These courses which are usually two years in length are insufficient in number to meet the demand for trained personnel.

Hostess training helps a girl prepare for a stewardess career with a commercial air carrier. Airlines have a substantial continuing need for new stewardesses due to a high turnover rate (usually because of marriage), and community colleges can become a prime source for these airlines. Community college programs do not attempt to duplicate the specialized training provided by the airlines, but include a general education background, principles of personal development, and an understanding of the aviation industry. As stated by Stewart M. Angle, Head, Aviation, Mt. San Antonio College: "A girl should be taught to understand the 'living room' in the sky in which she will be the hostess."

Aviation administration training, which includes programs in air transportation, airport management and aircraft marketing, is not yet widely offered in the community college field. The success of many smaller businesses related to or directly connected with aviation has been limited by the severe shortages of capable

management personnel. These programs generally draw heavily upon the business administration department of the college.

Air traffic controller training is the newest type of college aviation program and is considered by some to be the most critical from a personnel supply and demand viewpoint. Material is currently being developed by the FAA regarding the educational and training requirements for applicants for positions as air traffic controller specialists*.

Additional information about the above programs and details about existing programs can usually be obtained by writing colleges offering the programs. A partial list of community college aviation programs is included in the Appendix.

MISUNDERSTANDINGS ABOUT COMMUNITY COLLEGE AVIATION EDUCATION

A number of misunderstandings were brought to light and clarified by industry, government and education representatives at the ABC. A summary of the five most common misunderstandings listed in the approximate order of frequency follows:

Misunderstanding No. 1: *"Airlines have a crying need for pilots."*
Correct information: Airline representatives pointed out that although they will have a continuing need for flight crews due to increasing fleet sizes, and due to retirement of pilots trained during World War II, applicants will find competition to be very high for these positions. Airlines will commonly require four years of college, plus substantially more flight experience than generally provided in community college programs.

Misunderstanding No. 2: *"Employment opportunities are mostly in the airlines."*

Correct information: The need is widespread. For example, general aviation is the fastest growing segment of aviation and offers great potential for community college trained personnel in many areas of employment including administrative and managerial personnel, maintenance technicians and pilots.

Misunderstanding No. 3: *"Colleges must make a large investment to begin an aviation program."*

Correct information: It is not necessary to purchase airplanes or facilities in order to offer flight training. Aircraft can be leased or rented, or an agreement can be made with a local fixed base operator (FBO) for ground or flight training. Schools beginning A&P mechanic courses frequently find that the initial investment is reduced due to equipment already available for instruction in machine shop, welding, drafting, hydraulics, etc.

Misunderstanding No. 4: *"Community college avaition career programs should be terminal rather than transferrable in nature."*

**Information may be secured from the Office of the Chief, Educational/Training Methods/Technique Analysis, FAA, Department of Transportation, Washington, D. C., 20590*

Correct information: Many of the opportunities in the rapidly expanding field of aviation require maximum ability to grow and adapt as the industry develops. Although many employment possibilities are open to graduates of two-year programs there is considerable value to advanced aviation training. Students should understand the extent to which the credits earned will be accepted by a four-year college.

Misunderstanding No. 5: *"Colleges must go 'all the way' and offer full career aviation programs."*

Correct information: Colleges may wish to offer a basic course for students not interested in aviation as a career. A typical course is basic aviation theory. This course, generally carrying three semester-hours credit, may provide private pilot ground school training, history of aviation and career opportunities. The flight course counterpart could be offered in cooperation with a local FBO. This might be a three semester-hour course consisting of 35 to 50 hours of flight training to prepare for the private pilot certificate.

Additional courses could be offered at any time with the private ground and flight courses retained as introductory courses. Even if a complete program is offered in aviation, these preparatory courses could and probably should be offered to all students on an elective basis.

SURVEY OF COMMUNITY COLLEGE AVIATION PROGRAMS

The interest and enthusiasm generated by the ABC was considerable and clearly indicated a need for further cooperative planning by industry and education. After considering various plans, Dr. Lewis Fibel, Specialist in Occupational Education, American Association of Junior Colleges, and the authors, determined that the next logical step was to conduct a survey of junior college aviation programs.

Accordingly, such a survey was conducted by one of the authors under the sponsorship of the Cessna Aircraft Company*.

In order to have maximum participation, the survey was conducted by means of telephone interviews. Eighty-six percent of the seventy-three community colleges known to offer aviation-related training at that time participated in the survey. The interviews averaged thirty minutes per college.

Since flying programs are the most predominant type of aviation offering in the community college and since the majority of misunderstandings and problems identified at the ABC related to flight training, the survey concentrated on this aspect of aviation education. A summary follows:

1. Eighty-three percent of the colleges surveyed offer their aviation courses for credit.

2. Most colleges employ more than one type of ground school training aids. Seventy-eight percent use Sanderson material; 58% Federal Government; 55% Jeppesen; 25% homemade; 13%AV and 13% miscellaneous.

3. Seventy-seven percent of the instructors that teach college ground school courses are full-time faculty members; most of the others are employed by FBOs.

4. Fifty-six percent of college-employed ground school instructors are employed specifically to teach ground school; 27 percent are part-time employees with other incomes and 17 percent are full-time faculty with non-aviation fields of specialty.

**Finch, Harold L., "A Survey of Community College Aviation Programs-1968: Volumes I & II." (Unpublished report for Cessna Aircraft Company), Wichita, Kansas, August, 1968.*

5. Eighty-five percent of the flight training programs were initiated subsequent to 1965.

6. Eighty-six percent of the flight instructors are supplied by FBOs; most of the others are employed by the colleges.

7. Seventy-eight percent of the colleges report growing enrollment trends in their aviation programs; 18 percent are unchanged and 4 percent are declining.

8. Eighty-three percent of the flight courses are offered for college credit.

9. Seventy-nine percent of the programs lead to an associate degree.

10. There are wide differences throughout the nation in the amount of credit given for aviation training and in the cost of the programs.

11. Course credits and costs:

	Semester-Hour Credits			Cost		
	Min.	Max.	Mean	Min.	Max.	Mean
Private Ground	0	9	3			*
Private Flight	1	6	3	$400	$788	$610
Commercial Ground	0	9	4			*
Commercial Flight	3	11	6	$1250	$3000	$2750

*75% of the colleges charge tuition only; the remainder charge an additional nominal fee.

12. Fifty-four colleges offering flight training report a total enrollment of 3361 students for an average of 62 students per program. Enrollments range from 5 to 735.

13. The ratio of current graduates of aviation programs to the number of students currently enrolled is low–about 1 to 10. This is due in part to the rapid growth of many of these programs, and also is a reflection of a high attrition rate in many of the programs.

14. The objectives for initiating flight programs most frequently given are:
    a. To prepare students for careers as pilots (airlines 72%; general aviation 18%).
    b. To provide a service to the community.

15. Follow-up studies have been sparse; however, the available data show that graduates are having little success in obtaining employment as flight crew members with commercial airlines. Military veterans are currently fulfilling the flight crew needs of the airlines; however, two schools reported placing graduates with air carriers.

16. Ninety percent of the colleges surveyed "farm out" their pilot training to local FBOs and do not own airplanes or directly employ flight instructors. Some

purchase airplanes and employ ground and flight instructors on their own staff. Some lease aircraft, but employ college staff members as flight instructors.

17. The predominate reason for contracting the training to local FBOs is to avoid high capital outlay. Another reason is to reduce the liability of the college.

18. Three makes of aircraft are flown by the colleges surveyed. Sixty-seven percent of the responses are Cessna; 22% Piper; 11% Beech.

19. The cost of leasing aircraft ranges from $8.00 to $16.00 per solo hour, with the mean being $12.15.

20. Survey participants estimated that a modern simulator could substitute for an average of 4 hours of flight time toward a private license. Approximately 50% currently employ simulators in some phase of their training.

21. Liability coverage is provided as follows:
    By FBOs-68%
    By colleges-14%
    By miscellaneous means or no coverage-18%

22. Reported problem areas in descending order of severity are:
    a. Placement of graduates.
    b. Cost.
    c. Indifference on the part of airlines.
    d. Coordination with the FBO.
    e. Obtaining qualified administrative and instructional personnel.
    f. Insufficient number of four-year aviation programs to accommodate transfer students.
    g. Administrative opposition.
    h. Student recruitment.

23. The average age of students is under 25 years at all responding colleges. The students are reported to be average in ability (some colleges screened the aviation applicants and subsequently enroll better than average students).

24. Eighty-two percent of the students are non-veterans and a majority of these do not seek loans.

25. Existing programs were generally developed with the assistance of advisory committees and by studying information about flight programs of other colleges.

26. Suggestions for assistance needed:
    a. Assist in arranging more ABC-type conferences.
    b. Provide an aviation education clearinghouse service.
    c. Develop realistic manpower data.
    d. Provide technical advisory assistance.
    e. Provide scholarships and assistance in reducing costs.
    f. Develop program guidelines.
    g. Give promotional support.

CONCLUSIONS

- **Aviation is large and growing.** It has been the nation's largest employer outside of agriculture since 1962, and is growing at a much faster rate than the economy as a whole.

- **Aviation has many facets.** Functionally, it includes general aviation, air carriers, manufacturing and the aviation activities of the federal government.

- **Aviation belongs in the community college.** It prepares students to qualify for the many college-level jobs in aviation, to be more effective in non-aviation careers, to be better informed citizens, and to attain personal satisfaction.

- **Community colleges can teach many aviation skills.** Programs offered include pilot training, aviation mechanics and technology, aviation administration, air traffic control and hostess training.

- **Aviation programs are diverse.** There are large differences among colleges in what is offered, how much credit is given, what the training costs, the source of equipment and staff and in the objectives of the program.

- **Misunderstandings and problems.** Since aviation in community colleges is in its infancy, misunderstandings and problems have arisen. A number of the misunderstandings were identified and clarified at the ABC, and positive steps are being taken to resolve problem areas.

- **Suggestions.** Most of the suggestions by college officials contacted during the survey indicated a need for improved communications among schools and between the aviation industry and education.

APPENDIX

APPENDIX
COLLEGES INCLUDED IN SURVEY*

This survey includes community colleges which have existing aviation programs. It was generally limited to colleges with enrollments of more than 1000 students.

Name of College	Location	Pilot Training		Admini-stration	Electronics	Technology A&P	Hostess
		Ground	Flight				
Cochise College	Douglas, Arizona	■	■	■	■		
Glendale Community College	Glendale	■	■				
Chabot College	Hayward, California	■					
College of the Redwoods	Eureka	■	■				
Cypress Junior College	Cypress	■	■				■
Diablo Valley College	Pleasant Hill	■					
Foothill College	Los Altos Hills	■	■				
Fresno City College	Fresno					■	
Glendale College	Glendale	■	■			■	
Laney College	Oakland	■				■	
Los Angeles Trade Tech. College	Los Angeles	■			■	■	
Long Beach City College	Long Beach	■	■			■	■
Mira Costa College	Oceanside	■	■				
Monterey Peninsula College	Monterey	■					
Orange Coast College	Costa Mesa	■		■			■
Reedley College	Reedley	■				■	
Sacramento City College	Sacramento	■				■	
Santa Rosa Junior College	Santa Rosa	■					

Rangely College	Rangely, Colorado	[redacted]	[redacted]				[redacted]
Gulf Coast Junior College	Panama City, Florida	[redacted]	[redacted]	[redacted]			
Manatee Junior College	Bradenton	[redacted]	[redacted]				
Miami-Dade Junior College	Miami	[redacted]	[redacted]	[redacted]			[redacted]
Pensacola Junior College	Pensacola	[redacted]					
St. Petersburg Junior College	St. Petersburg	[redacted]	[redacted]				
Ricks College	Rexburg, Idaho	[redacted]					
Central YMCA Community Coll	Chicago, Illinois	[redacted]					
Danville Junior College	Danville	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]
Illinois Junior College Dist. 522	Belleville	[redacted]	[redacted]				
Rock Valley College	Rockford	[redacted]	[redacted]			[redacted]	
Vincennes University	Vincennes, Indiana	[redacted]	[redacted]			[redacted]	
North Iowa Area Community Coll	Mason City, Iowa	[redacted]					
Neosho County Community Coll	Chanute, Kansas	[redacted]					
Wentworth Institute	Boston, Massachusetts					[redacted]	
Delta College	University Center, Mich	[redacted]					
Grand Rapids Junior College	Grand Rapids	[redacted]					
Kellogg Community College	Battle Creek	[redacted]					
Hinds Junior College	Raymond, Mississippi					[redacted]	
Missouri Western College	St. Joseph, Missouri	[redacted]	[redacted]				
Metropolitan Junior College	Kansas City	[redacted]	[redacted]				
Academy of Aeronautics	Flushing, New York					[redacted]	
State University-Cobleskill	Cobleskill	[redacted]					

Northeastern Oklahoma A&M Coll	Miami, Oklahoma	■	■				
Northern Oklahoma College	Tonkawa	■	■				
Mt. Hood Community College	Gresham, Oregon	■	■				
Portland Community College	Portland					■	
Southwestern Oregon Comm Coll	Coos Bay	■					
Treasure Valley Community Coll	Ontario	■	■				■
Williamsport Area Comm Coll	Williamsport, Penn					■	
Tarrant County Junior College	Ft. Worth, Texas					■	
Texarkana College	Texarkana	■	■				
Dixie College	St. George, Utah	■	■				■
Clark College	Vancouver, Wash	■					
Green River Community College	Auburn	■					
Highline College	Midway			■			■
Seattle Community College	Seattle					■	
Spokane Community College	Spokane	■				■	
Yakima Valley College	Yakima	■	■				
Casper College	Casper, Wyoming	■					

**This is not a complete list of community college aviation programs. Additions and corrections are welcomed and may be reported to the Institute for Community College Development (see following page).*

Please check the preceding chart and submit any additional information about your program in the blanks below:

Name of College _____

Location _____

Phone No. (Include Area Code) _____

Name of Aviation Director _____

Title of Aviation Director _____

Aviation Programs offered:

____ Ground Training
____ Flight Training
____ Administration
____ Electronics
____ A & P
____ Hostess
____ Air Traffic Controller

Check for copies of ABC luncheon addresses by:

____ Dr. Leslie L. Thomason (Cessna Aircraft Co.)
____ Congressman Donald Clausen (California)

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